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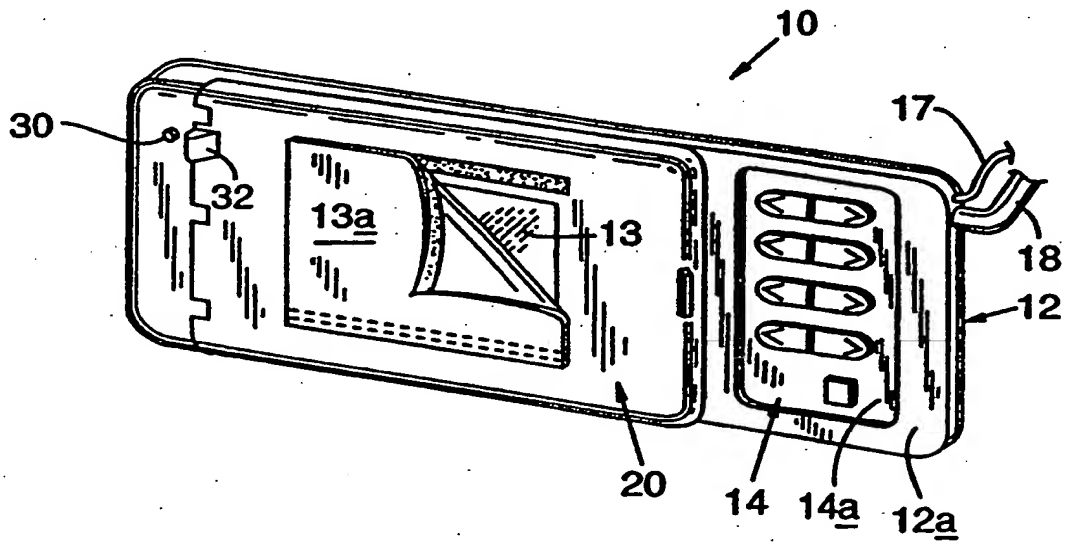
(54) Title: PERSONAL VIDEO SYSTEM



(57) Abstract

A personal video system is provided, the system employing a thin housing configured to mount a video display and associated–electronics module side–by–side. In the preferred embodiment, the housing takes the form of a vehicle sun visor, the display being mounted such that its viewing surface lies generally flush with a front panel of the housing. Mounted to the housing is a flap which pivots between a closed orientation wherein the flap lies against the front panel and an open orientation wherein the flap extends from the front panel. A video disconnect interrupts operation of the display except when the flap is in its open orientation such that the display is shielded from view of a vehicle driver. A video input provides a video signal to the control panel, and correspondingly, provides a control signal to the display.

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PERSONAL VIDEO SYSTEM

Technical Field

The present invention relates generally to video systems, and more particularly, to a personal video system wherein the system's video display is mounted side-by-side with a control module which directs operation of the display. Although the invention has broad utility, it is described below in the context of a thin, generally planar vehicle sun visor having a flap which selectively is configured to shield the video display from a driver's view.

Background Art

For many years now, developers of video technology have strived to produce a video system suitable for use in a confined space such as the passenger compartment of a vehicle. Such a system would be useful in providing passengers with entertainment (i.e., video games, television, etc.), but also could be useful in providing information beneficial to the vehicle's operation. It will be noted, for example, that a video system could replace rear view mirrors which may be ineffective due to a load which obstructs the driver's line of sight. Similarly, a video system could be used to display maps, vehicle instrumentation or even maintenance information for the vehicle.

Unfortunately, known video systems have been unable to meet consumer expectations, due at least in part to difficulties in providing acceptable picture quality within a package of suitable shape and size. This problem has been particularly prevalent in video systems intended for use in an automobiles or other vehicles of similar size. These systems typically must be thin enough to mount in the vehicle's dashboard, an instrument panel or the like. Conventional picture tubes are just too thick.

Until recently, flat-panel displays (such as LCD's) also have been thicker than desired, and have been characterized by a picture quality which is unacceptable for many video applications. However, with advancements in flat-panel display technology, picture quality has improved dramatically. Furthermore, it has become possible to separate some of the electronic circuitry

from the flat-panel display in recent years. The present invention takes advantage of such capability in providing a personal video system which is of suitable quality and size.

Another problem with conventional vehicle-mounted video systems relates to difficulties in ensuring that the display is not a distraction to the driver. It therefore would be desirable to provide a video system which is configured such that it may be mounted to ensure that the display is outside of the driver's field of view.

Disclosure of the Invention

The aforementioned goals and objectives are met by provision of a personal video system which employs a video display and associated electronics, which might include control circuitry, mounted side-by-side in a thin, generally planar housing. The housing typically takes the form of a vehicle sun visor, the display being mounted such that its viewing surface faces a passenger when the visor is deployed. The viewing surface thus lies generally flush with a front panel of the visor the visor's front panel also typically carrying the system's controls. However, the system's controls may also be located elsewhere such as the passenger armrest.

In the preferred embodiment, the display is an LCD display selectively shielded from view of the vehicle driver by a flap which pivots between a closed orientation wherein the flap lies against the front panel to cover the display, and an open orientation wherein the flap extends from the front panel to reveal the display only to those within a predetermined field of view. The associated electronics preferably includes control circuitry which is operatively connected to the display to direct the display's operation, but also may include a video disconnect which interrupts operation of the display except when the flap is in its open orientation. A receiver, player or camera is operatively connected to the control module through which a video signal is provided to the display.

These and other objects and advantages of the present invention will be more readily understood after a consideration of the drawings and the detailed description of the preferred embodiment which follows.

Brief Description of the Drawings

Fig. 1 is an isometric view of a personal video system in the form of a vehicle sun visor constructed in accordance with a preferred embodiment of the invention.

Fig. 2 is an isometric view of the personal video system depicted in Fig. 1, but with a view-obstructing flap pivoted to its open orientation so as to obstruct the display's viewing surface from the vehicle driver's view.

Fig. 3 is a top plan view of the sun visor shown in Fig. 1.

Fig. 4 is a somewhat simplified top plan view of a vehicle illustrating use of the personal video system depicted in Figs. 1 and 2.

Detailed Description of the Preferred Embodiment and Best Mode of Carrying Out the Invention

Figs. 1 through 3 depict a personal video system 10 constructed in accordance with a preferred embodiment of the invention, such system taking the form of a visor of the type commonly used in automobiles to shield a driver or passenger from direct sunlight. More particularly, the system takes the form of a passenger-side vehicle sun visor which may be used alternatively as a conventional sun visor, or as a fully-functional video unit.

In accordance with my teachings, the visor includes a body 12 for use in housing the system's video components (i.e. associated-electronics module 14 and video display 16). The associated electronics module includes at least some of the system's electronic circuitry (e.g., inverters, video boards) and the control circuitry includes control-interface circuitry. The video display includes the system's viewing interface which may take the form of an LCD panel, a TFT (thin film transistor) panel, a PDP (plasma display panel), an electroluminescence panel, or any other flat or non-flat panel display. As used herein, the term panel display means any of the above types of viewing

interfaces. The body (or housing) pivotally mounted on the vehicle via an elongate rod 18. The housing thus is pivotally adjustable according to the needs of the passenger and the visor's intended use.

As indicated, the housing is generally planar, is typically rectangular, and may include various conventional visor accouterments such as mirror 13 and mirror cover 13a. Less conventionally, however, the visor includes an embedded associated-electronics module 14 (which preferably includes control circuitry) and an embedded video display 16. When control circuitry is included in the associated-electronics module, that module may also be thought of as a control module. Components making up the associated-electronics module (including control circuitry) are available, for example, from Sharp Microelectronics Technology, Inc. of Camas, Washington and LG Electronics, Inc. of South Korea. Even with module 14 and display 16, the housing remains relatively thin, preferably being on the order of approximately ½-inch to 1½-inches thick. This is accomplished by separating the associated-electronics module and video display, typically by mounting them in the visor side-by-side.

With reference to Figs. 2 and 3, it will be noted that the associated-electronics module and video display are mounted generally flush with the housing's front panel 12a, which typically faces the passenger when the visor is deployed. As indicated, associated-electronics module 14 includes a control panel 14a which faces the user to provide a variety of video display controls (volume, contrast, brightness and tuning). Video display 16 includes a viewing surface 16a which is flush with front panel 12a. The depicted video display employs flat panel technology, preferably taking the form of an LCD display.

Cable 15 provides a path for passing control signals between the associated-electronics module and the video display, the associated-electronics module typically deriving such control signals from corresponding video signals received from a video input (indicated generally by cable 17 in Figs. 1-

3). The video input may take the form of an onboard camera, a broadcast signal receiver, a VCR, a computer, or any other device capable of producing a video signal. The video display is powered by an onboard battery (not shown).

In the depicted embodiment, the video display is protected by a pivotally adjustable flap 20, which is mounted on the housing's front panel to pivot about hinges 22 as indicated by arrow 24. The flap thus pivots between a closed orientation (Fig. 1) wherein the flap covers the video display's viewing surface, and an open orientation (Fig. 2) wherein the flap has been adjusted so as to reveal viewing surface 16a. A brace 26 may be employed to selectively hold the pivotal flap in its open orientation as shown. The flap similarly may be held in its closed orientation by fasteners such as magnetic elements 28a, 28b (Fig. 2).

Although the depicted flap typically is sized only to cover the display's viewing surface, it will be understood that the flap may be enlarged to cover control panel 14a as well. In any event, however, the flap is of a size which prevents the driver from viewing the video display when the flap is in its open orientation. Furthermore, the associated-electronics module may include a video disconnect 30 which interrupts operation of the display when the flap is not in its open orientation.

In the depicted embodiment, the video disconnect takes the form of a push-button which nominally interrupts power (or the control signal) to the video display. However, upon depressing the push-button, the video disconnect is disabled, allowing operation of the video display. Accordingly, flap 20 has been provided with a projecting tab 32, the tab being configured to engage push-button 30 when the flap is pivoted to its open orientation. Such engagement is illustrated in Fig. 3 where the flap is depicted its open orientation at 20' in dashed lines. As indicated at 32' (also in dashed lines), the projecting tab engages the push-button to allow activation of the video display. The video system thus is operable only when flap 20 is pivoted to an open orientation whereby the driver's view is obstructed.

Fig. 4 demonstrates use of video system 10 in a vehicle such as automobile 100. As indicated, the video system takes the form of a vehicle sun visor, the visor's housing 12 including a flap 20 which has been pivoted to its open orientation. Although the open orientation herein is shown as perpendicular to the front panel, it will be appreciated that the system may be made operable with the flap in alternative orientations so long as the driver's view of the viewing surface 14a is blocked. Accordingly, Fig. 4 shows driver D with a line of sight DS which does not allow him to see the viewing surface of the video system (the driver's view is obstructed by panel 20). Conversely, passenger P is has a line of sight PS which allows him to see the display's viewing surface without obfuscation.

Fig. 4 also illustrates a possible source for the video signal described above. In the depicted vehicle, the video signal is provided by video input 110, which is mounted on the trunk of the vehicle. The depicted mounting position could prove suitable for video inputs such as cameras, broadcast signal receivers, or any other video source which need not be readily accessible to the driver or passenger. A VCR or computer similarly could be mounted, or could be mounted in the dashboard of the vehicle itself.

While the present invention has been shown and described with reference to the foregoing operational principles and preferred embodiment, it will be apparent to those skilled in the art that other changes in form and detail may be made therein without departing from the spirit and scope of the invention as defined in the appended claims.

I CLAIM:

1. A personal video system comprising:

a thin housing having a front panel;

a video display mounted on the housing, the display including a viewing surface configured to lie generally flush with the front panel of the housing; and

an associated-electronics module mounted on the housing beside the video display, the associated-electronics module being operatively connected to the display to direct operation of the display.

2. The video system of claim 1, wherein the video display includes a panel display.

3. The video system of claim 1, wherein the housing includes a flap which is movable between a closed orientation, and an open orientation wherein the flap extends from the housing so as to at least partially shield the display from view.

4. The video system of claim 3, wherein the associated-electronics module includes control circuitry with a video disconnect configured to interrupt operation of the video display, the video disconnect being disabled when the flap is in the open orientation.

5. The video system of claim 4, wherein the flap is pivotal.

6. The video system of claim 5, wherein the flap includes a brace for use in selectively maintaining the flap in the open orientation.

7. The video system of claim 1, wherein the housing is a vehicle sun visor.

8. The video system of claim 7 which further comprises a video input
operatively connected to the associated-electronics module for providing a video signal to the associated-electronics module.

9. The video system of claim 8, wherein the video input includes
a vehicle-mounted camera which provides the video signal to the associated-electronics module.

10. A personal video system for use in a vehicle, the video system comprising:

a vehicle sun visor including a front panel with a flap which is pivotal between a closed orientation wherein the flap lies against the front panel and an open orientation wherein the flap extends from the front panel;

a thin film transistor display mounted on the visor, the display including a viewing surface which lies generally flush with the front panel of the visor, the viewing surface being shielded from view of a vehicle driver when the flap is in the open orientation; and

a control module mounted on the visor beside the thin film transistor display, the control module being operatively connected to the display to direct operation of the display.

11. The video system of claim 10, wherein the control module includes a video disconnect configured to interrupt operation of the display, the video disconnect being disabled when the flap is in the open orientation.

12. The video system of claim 11, wherein the flap includes a brace for use in selectively maintaining the flap in the open orientation.

13. The video system of claim 10 which further comprises a video input operatively connected to the control module for providing a video signal to the thin film transistor display.

14. The video system of claim 13, wherein the video input includes a camera mounted on the vehicle to provide the video signal to the control module.

15. The video system of claim 13, wherein the video input includes a receiver configured to receive a broadcast video signal and to provide the broadcast video signal to the control module.

16. The video system of claim 10, wherein the control module includes a control console, the flap being sized to overlie the control console when in the closed orientation.

17. The video system of claim 10, wherein the sun visor is between approximately ½-inch and 1½-inches thick.

18. A personal video system for use by a passenger of a vehicle, the video system comprising:

a thin, generally planar sun visor including a front panel with a flap which is pivotal between a closed orientation wherein the flap lies against the front panel and an open orientation wherein the flap extends from the front panel, the flap including a brace for use in selectively maintaining the flap in the open orientation;

an LCD display embedded in the visor, the display including a viewing surface which lies generally flush with the front panel of the visor, the viewing surface being shielded from view of a vehicle driver but viewable by the passenger when the flap is in the open orientation;

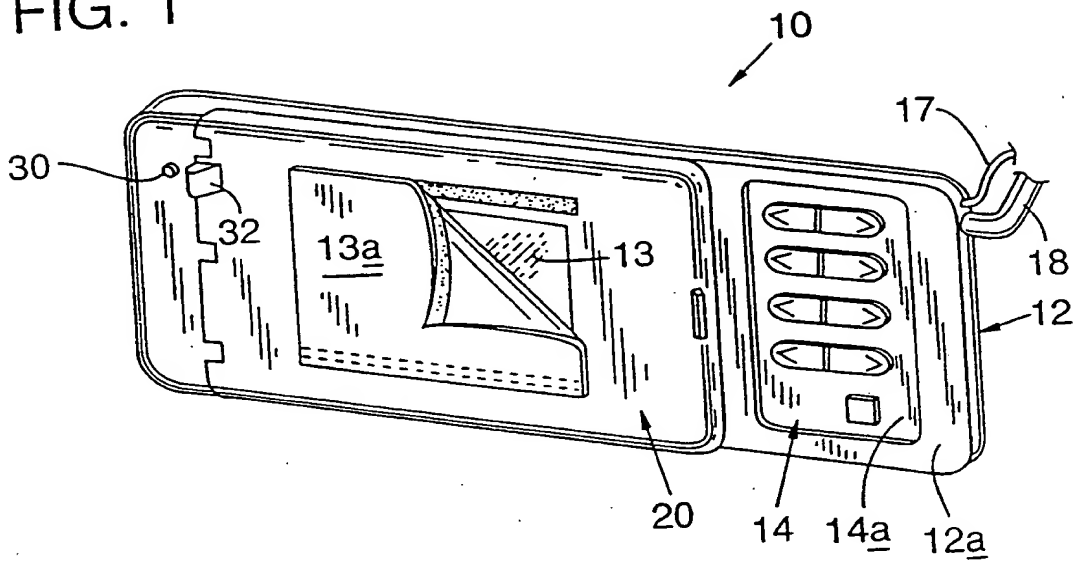
a control module embedded in the visor beside the LCD display, the control module being operatively connected to the display to direct operation of the display and including a video disconnect configured to interrupt operation of the display except when the flap is in the open orientation so as to shield the viewing surface from view of the driver; and

a video input operatively connected to the control module for providing a video signal to the control module, and correspondingly, for providing an associated control signal to the LCD display.

19. The video system of claim 18, wherein the video input includes a camera mounted on the vehicle to provide the video signal to the control module.

20. The video system of claim 18, wherein the video input includes a receiver configured to receive a broadcast video signal and to provide the broadcast video signal to the control module.

FIG. 1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17
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13a
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18
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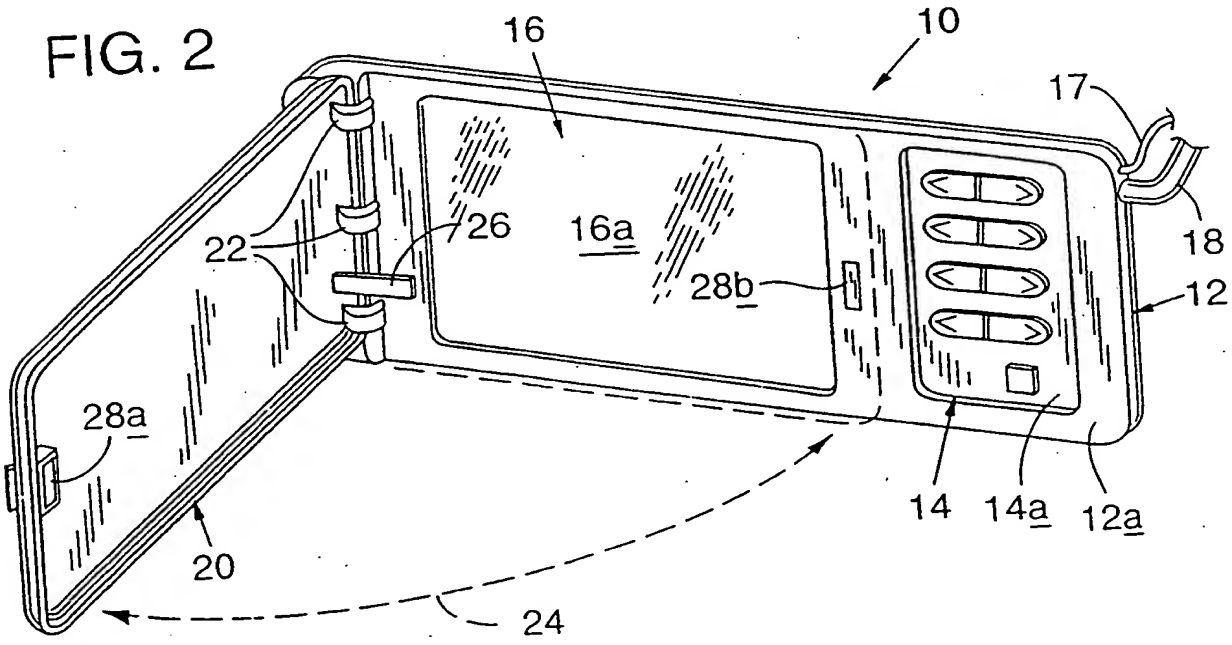
14
14a
12a

FIG. 2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22
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16a
28b
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28a
14
14a
12a
20
24

FIG. 3

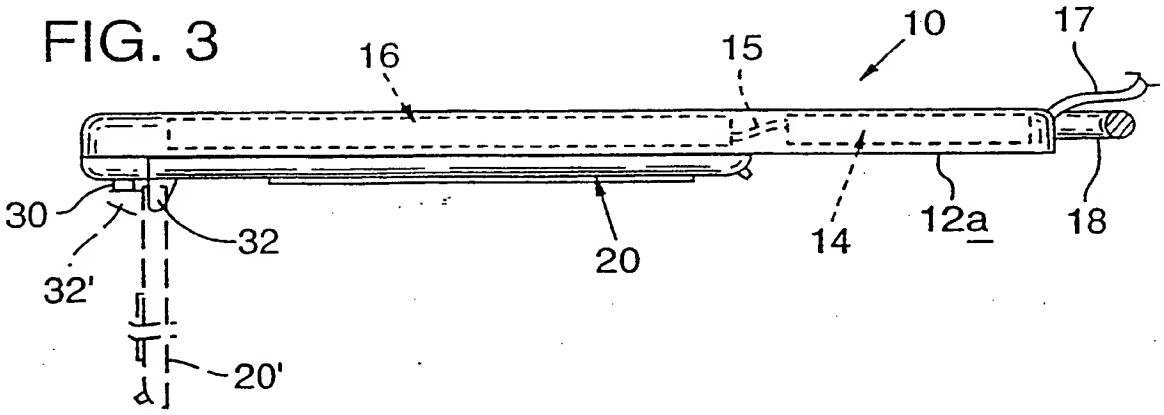
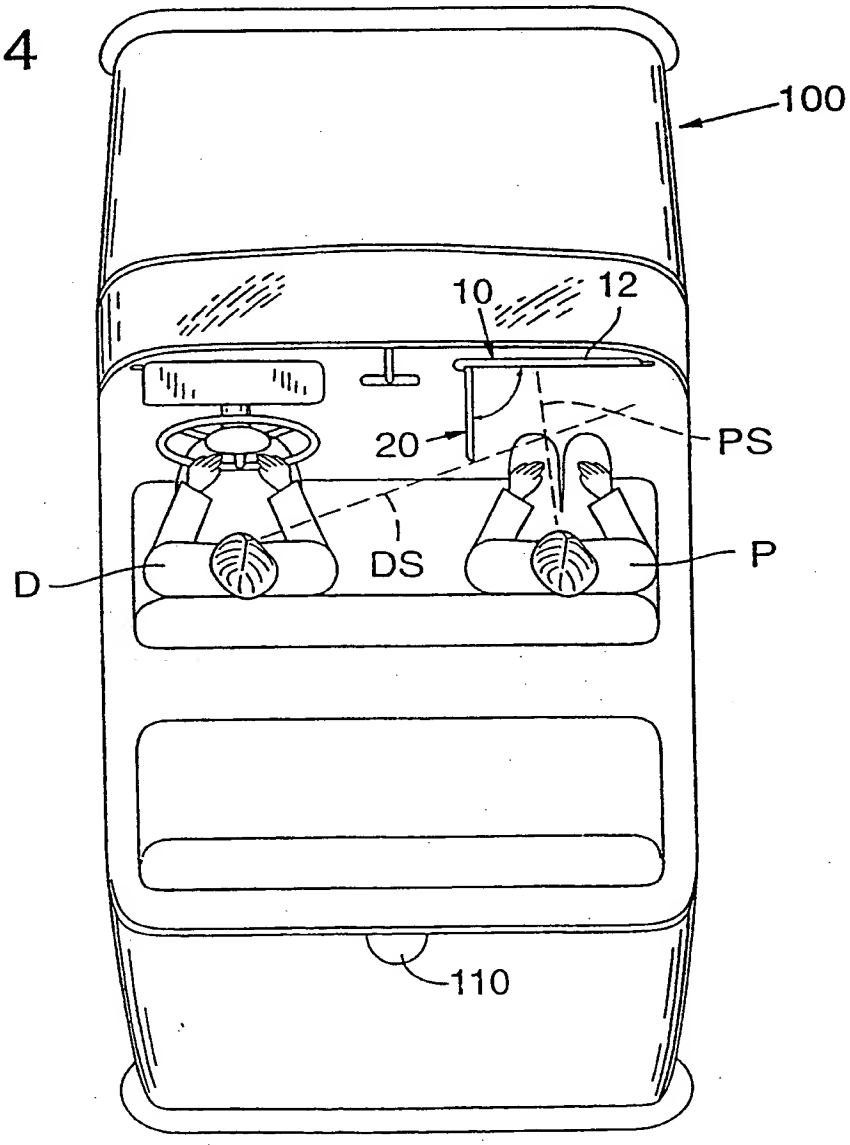


FIG. 4



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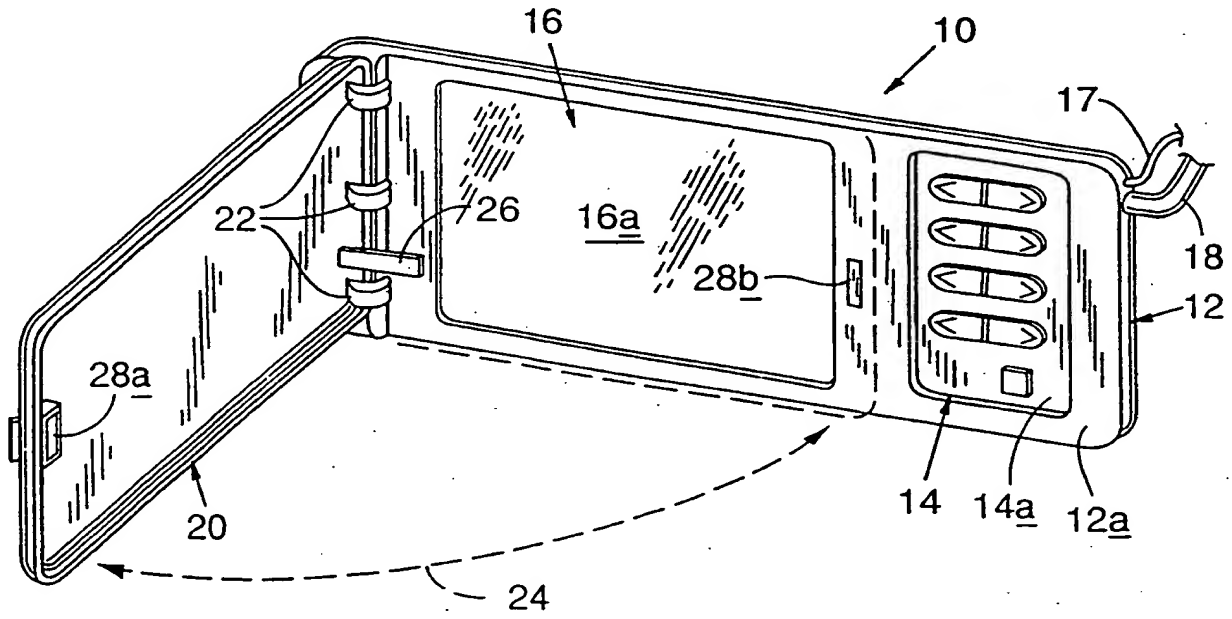

(57)Abstract

A personal video system employing a thin housing (10) to mount a video display (16) and associated electronics module (14) side-by-side. In the preferred embodiment, the housing takes the form of a vehicle sun visor, the display (16) being mounted such that its viewing surface (16a) lies generally flush with a front panel (12a) of the housing (10). Mounted to the housing (10) is a flap (20) which pivots between a closed orientation wherein the flap (20) lies against the front panel (12a) and an open orientation wherein the flap (20) extends from the front panel (12a). A video disconnect (30) interrupts operation of the display except when the flap (20) is in its open orientation such that the display (16) is shielded from view of a vehicle driver. A video input (17) provides a video signal to the control panel (14) and, correspondingly, provides a control signal to the display (16).

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INTERNATIONAL SEARCH REPORT

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PCT/US97/24086

A. CLASSIFICATION OF SUBJECT MATTER
IPC(6) :H04N 5/645
US CL :348/148, 794, 836, 837; 455/347; 345/905
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 348/148, 151, 787, 789, 794, 836-839, 843; 455/344-349, 99; 345/903, 905, 7; 349/13-14, 16

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Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

APS, GPIC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 4,843,477 A (MIZUTANI ET AL) 27 JUNE 1989, FIG. 7; COL. 8, LINES 54-57.	1, 7-8 --- 2-6, 9-20
A	US 4,362,907 A (POLACSEK) 07 DECEMBER 1982, FIG. 2.	1-20
A,E	US 5,689,822 A (ZUCKER) 18 NOVEMBER 1997, FIG. 1.	1-20
A	US 5,519,410 A (SMALANSKAS ET AL) 21 MAY 1996, FIG. 1; COL. 4, LINES 13-23.	1-20
A	US 5,331,448 A (KAJIYAMA ET AL) 19 JULY 1994, FIG. 1.	1-20

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08 APRIL 1998

Date of mailing of the international search report
28 SEP 1998

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